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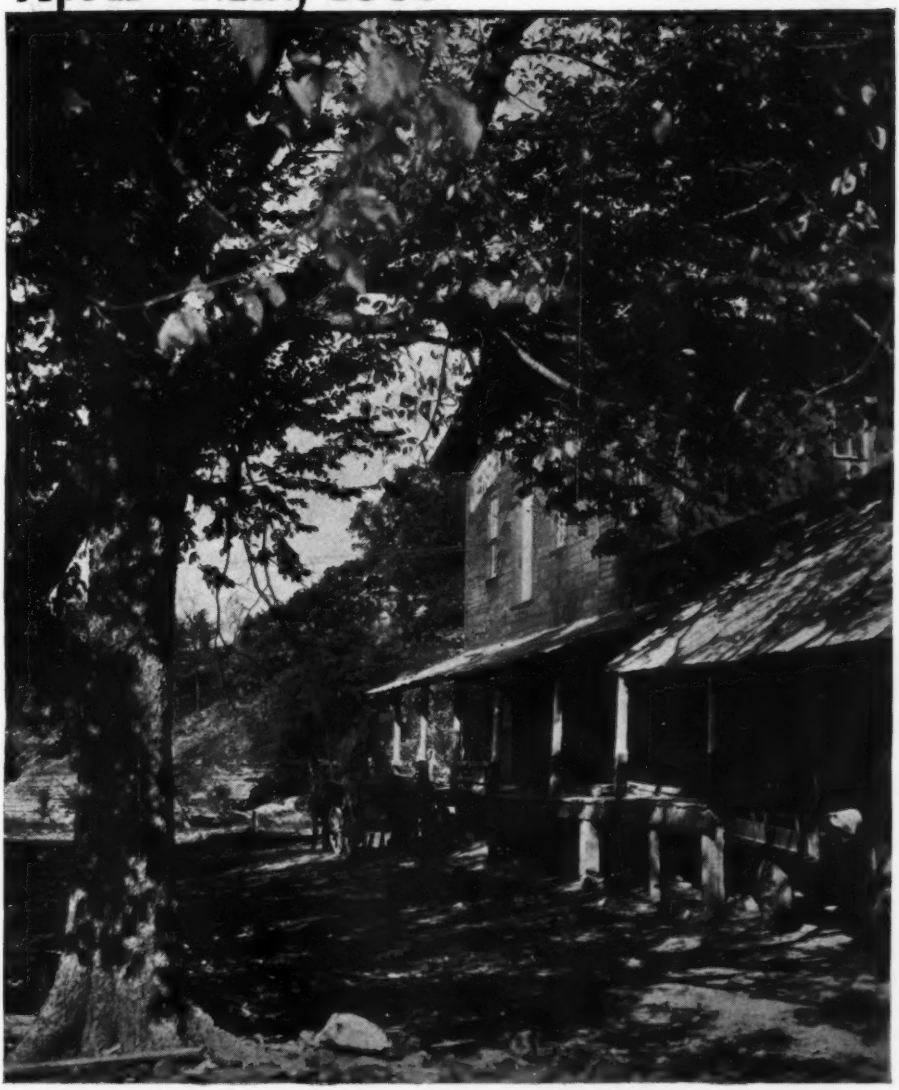

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Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

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Editorial Offices: 19 West 44th Street, New York

VOLUME XIX NUMBER ONE

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Agricultural and Scientific Bureau
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WHEN THE OPEN ROAD BEGINS TO CALL.

Better Crops with PLANT FOOD

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VOL. XIX NEW YORK, APRIL-MAY, 1933 No. 1

Spring, with Nature awakening, brings—

Faith Anew

By Jeff McDermid

LET us stand by the pasture gate when the meadows are lush and the fescue is heading and the white clover and the bumblebee are keeping company with dewdrops and sunbeams in the land of Milk and Honey. It is good to get away from the confusion of the bleating radio and the contradictions of the newspapers, and come close to the grass roots again to ponder like Whitman and Sandburg or watch the cloud shadows and the nodding blossoms of the lilacs and the locust trees.

Most of us soil-born and farm-reared folks can never come to accept completely the theory that superabundance is sinful and that diminished food must be the ultimate good. We try hard to square our mental perceptions with our soul's intuitions, trying to force ourselves and our friends to accept the fatal logic that he who has health and land and seed should relinquish his pleasant sovereignty so as to produce sparingly in order that others who have nothing may get more of nothing.

Mortgages and chattel papers shall for once be forgotten, for those cows in the fescue and the clover blossoms come up at eventide with brimming milk-wells, no matter who happens to be the judge or the jury, the creditor or the debtor. It's gadflies that disturb dairy cows in June time, not dusty documents in some old county court-house.

WE have bred them for generations to give us butterfat and custards, Devonshire clotted cream, foamy globules of whipping cream for our strawberries, yellow cheeses for noontime lunches, thick golden gravy for 'taters and onions, and gallons of liquid protein to make pork and juicy broilers. We have sold most of their male issue to the greedy veal markets of the city, and because they were quartered in green pastures and stabled in abundant countrysides, these calfless creatures adopted us. They gave us the substance of their pulsating bodies, made out of the stuff we raised with sweaty hopefulness; and so the dams welcomed the daughter calves we saved for them and added to the creamline of the herd with the ageless power of their chromosomes.

We have gone to auction sales and picked the best of the bullocks and the heifers, aiming for creamy hide and ear-lining, the pigments of plenty, as well as for the straight top-line, deep escutcheon, good broad muzzle, mild eyes, wide barrel, firm legs, and excellent heart girth. These and their progeny we have nurtured and catalogued, balanced in bone and flesh and milk flow on the largess of the best farms in the finest pastoral places that God ever gave to the husbandman.

Our professors have been paid hard-earned tax money to teach us all they know already about cows and then to find out what more there is to know. Most of these overall scientists have been skillful with test-tubes and manure forks and they have taught us to do better than Jacob and Esau or any other subsequent graziers, with the selfsame natural resources intended for human appetites.

And of all this we are proud and satisfied, because on this droning bee-clover, bell-tinkling, bird-singing spot we cannot accept the doctrine that what is good is wrong and that what is pregnant is barren.

We know, of course, that the cow is here and the hungry baby is there and that some obstacle separates the foster mother of mankind from those in want. But we have abiding faith in the spirit and resolve of our magnificent people and we are certain that patience a little longer will get a reward much quicker and kindlier than to follow malcontents and charlatans wielding the bloody club.

We consider that the goodness of the land in our State and the fruits nature has bestowed upon the land only set the scenic stage for the actors who determine the drama's worthiness.

Watching the cows browsing along the river brim or chewing their cuds and swishing at gnats beneath the oak trees where the sod is trampled into sand, we have a feeling that men who once owned this land and broke its pioneer sod somewhere are wondering to what stewardship they left it.

IT might be as well now to refer to them as crusaders, those farmers from afar who arrived in my State about a century ago, although they surely didn't look like Bohemund or Baldwin or wear any plumes, chain mail, or trappings of the joust. At least my granddad didn't in the tintype.

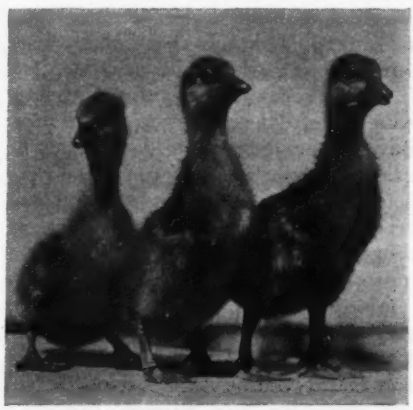
No doubt they were just as solicitous about "my ladye faire" as mud, rain, desolation, and wilderness permitted; even though her palfrey was an ox-cart and her bower happened to be a windy, clay-daubed cabin.

I suspect most of them were fed up on castles, dungeons, and red-nosed tyrants anyhow, and preferred to be squires in a raw hemisphere among four-legged wolves than to bow before

titles or pay tithes among two-legged ones.

They were sick of fading feudalism with its fosse and forke, infang theof and outfang theof, sackage and sockage, cuisage and jambage, and all the rights of free warren, pillage, rape, and kindred foot-kissing and cringing. So we look back upon this exodus of yeomen and behold them advancing upon this favored nook of America.

Among the first to come were the Germans, yes and some Austrians, pretty disgusted with old Metternich



and the failure of the Parliament of Frankfort. Finally they came to be known as the "forty-eighters" and one of them was Carl Schurz, another was Franz Siegel, men known as generals who led hosts of "Dutchmen" fresh from Heidelberg and the farms of my State into the hell-fire of the Civil War. Of course some of them founded breweries afterwards, but this is not in this epic.

And we had Vikings—men and women who drifted and washed their way over seas in the Restauratus, noble little Mayflower where they cooked lutfisk and told legends of Thor and Woden while sailing toward a land where their grandsons would become the best tobacco growers and teat-pullers known to diversified dairyland.

When I traced the honor roll of our Master Farmers this winter, it showed that three-quarters of them were upstanding lineal descendants of Germanic and Norse independents, and I argue that you can't get a stranglehold or an economic jiu-jutsu on men with that kind of fiber planted in their body cells.

Then we have Polish settlements where names are spelled with consonants and you get a premium if you can find a vowel. They also had a dark background and came over here to be citizens instead of serfs. In fact, we boast an international pageantry of farming and you can write a check in any language and have it translated.

The color of our fields and meadows after spring rains please the Irish and the handy hickory and buckthorn give them better fuel than the peat of their fathers, with decided advantages in the weight and grain for making shillalahs. And corn may be properly distilled.

WE visit our Welch neighbors, cow lovers and hard grubbers, whose recreation betimes is in Cambrian song that never can be issued over the radio because its syllables get stuck crosswise in the microphone. We depend upon them for our piety and they have never failed us. But they have guts as well as gospel and are not averse to using either a fist or a fast, whichever promises certain results.

Modesty forbids my including encomiums about my own canny race or their bloody relations, the English. Plenty of them came over when things got a bit thick and what they secured when they got here is here yet, even if some of it is being kept safe for them by proxy. It is terrific to think, however, what a sorry lot of kine and heatherbrowsers of the fold we would now have if my kinfolk had decided to stay in Aberdeen.

This makes up the All-American agricultural team that has thus far taken many touchdowns against the aggregation of despair which played against us since 1929. What has been lacking

is coaching or somebody to obey the coach when he did coach. But we are coming to that in 1933.

And don't you forget it, these mixed nationalities of my State went through some hard times together long before Hoover came along to be the goat for spleen. A few halting banks and limping security companies can't take the tuck out of men who worked in the lumber woods, cleared two-hundred-acre farms with raw knuckles, and made the greatest dairy commonwealth in the union in less than twenty-five years.

BUT as I talk with them and walk with them along the spring furrows in this potent season, I detect a new strain springing up in their make-up. It is not to their discredit either, and it runs like this perhaps:

That courage and stiff necks are inherited, but when forces keep popping at you from ambush and each day brings a new dread to turn on the radio or take down the receiver or go out to the mail box by the syringa bush, for a sort of unknown grapple with dilemma, then it begins to wear you down!

If Europe does this or doesn't do that; or if our governor can make enemies kiss each other through conferences; or folks swig enough at taverns to make barley pay—all those ifs and whereases interfere with the quiet and peaceful thoughts a fellow should have when plowing or laying by corn.

So they begin to wonder if farmers, however so pliant and sturdy, may not be like one man against the wind, with his courage. Would it not be wiser to go into a huddle or build a tank of some kind so as to pool that inherited courage and roll right into the teeth of the gale? This cooperative talk which farmers' institutes used to dally with, let's make it mean something besides a slogan to get memberships on the dotted line!

Oh, ho, that cooperative talk! How hard it was to make the ideals of the cooperative lecturers and the market leaders square right up with the fertile farm and the early bird at the plow handles. What sounded good for the mass never worked out for the man, anyhow not for the man with independence bred from tyranny.

They used to say that cooperation got recruits like the Devil got religion. Temporary spells of worse times filled the schoolhouses with Townleyites and eleventh-hour cooperators. The old mourning-bench creaked with its load of sin and sang with hymns of renunciation. Then the middleman and the profiteering milk dealer received such a tongue lashing that their ears burned, but nothing else.

Why even the government took a hand to lead the sinners to repentance. But it takes more than a preacher or a tall steeple or an usher to make a man get the power so he can snap up and crack his heels together in the name of cooperation, and keep on doing it when morning comes with the dawn.

Morning came with the dawn and each independent farmer hitched up his team and his galluses, spat on his competent palms, and careened full tilt along his own furrow, throwing the weeds over the fence on adjoining land, and digging ditches to let private ponds become public property. Let the ladies' auxiliary patch overalls and make quilt blocks to the cooperative music, but as for us, breed more cows and speed more plows! And the Devil was feeling stronger than Gabriel again, and so was the farmer.

AND so the farmer had himself to fight, as well as the weather, but he knew the weather better than he did himself. Hence the crop conquest was simpler than self-conquest. Nature evened up results on the weather basis. If it was dry the corn boomed, and if it was wet the pastures flourished. We usually got our thirty-six generous inches of real wet rainfall somehow during each calendar year. With

(*Turn to page* 32)

Potash Tripled Cotton Yield

By W. M. Nash

Wheatley, St. Francis County, Arkansas.

DURING the past few years we have learned that we cannot profitably grow cotton on the gray silt loam soils which prevail here in St. Francis county, Arkansas, without the use of potash. Both wilt and rust are prevalent and by using 200 pounds of 20 per cent kainit per acre on my own cotton, I have been able to almost entirely control these troubles. On my own farm cotton receiving 200 pounds kainit has regularly produced right at three times as much as the same kind of land produced without the use of potash.

Last year I was unable to buy enough of this fertilizer for my entire crop, and several acres had to go without it. On this portion of my crop I averaged 620 pounds seed cotton per acre, while that which received 200 pounds kainit averaged 1,760 pounds, or 1,140 pounds increase. This was due solely to the 200 pounds of potash. The ground where the kainit was not used was equally as good, as well prepared, and was cultivated more than that which received the kainit.

Where the potash was not used, the rust started in July, causing the leaves to turn yellow and start dropping off between August 1 and 15. Because the growth was checked early, few of the bolls ever became grown and there was not nearly as many of them.

The cotton without the potash produced a much shorter staple, only a third as many pounds, and was mean to pick. The bolls never did open wide. They just cracked about half open.

When I sold my cotton, the buyer remarked when he came to some of the bales coming from the unfertilized field, that this must have been grown on poor hill land. I told him, no, it grew on the same kind of land as the other and the only difference was in

(*Turn to page 26*)

Left: With 200 lbs. 20% Kainit. Right: Without potash.

Balanced Food *for* Potatoes

By F. L. Musbach

Professor of Soils, University of Wisconsin.

PLANTS require a balanced ration just as animals do. In the case of the dairy herd the ratio of protein to carbohydrates is fairly well established for the most profitable production of butter fat. This is quite universally so for all dairy breeds. In the plant kingdom, however, the thing becomes more complicated by reason of the fact that we are dealing with more variables. We have to deal particularly with climatic conditions, also soil differences, and the system of farming followed. Again crops have unlike root systems and different capacities for extracting plant food from the soil, but after all these differences are considered, we have in general certain characteristics as concerns their plant-food requirements.

The potato is essentially a storehouse for starch. After the water is squeezed out of the tuber, better than 80 per cent of the dry matter remaining is made up by what are known as carbohydrates, chiefly starchy materials. Potash is in some way intimately connected with the formation of starch and other carbohydrates. If potash is omitted in the mixture used or the supply available is low, typical potash hunger is manifested. Phosphate hastens maturity, and when used in moderate amounts, frequently reduces the yield by shortening the growing period; but potash in addition to phosphate balances the ration, resulting in satisfactory yields.

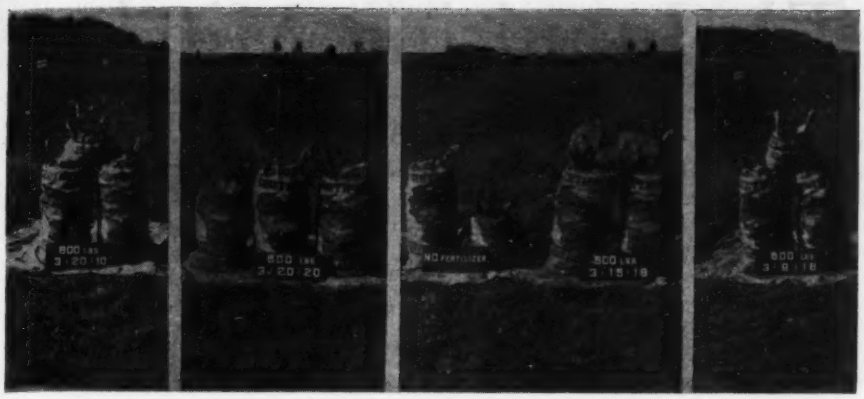
Just what is the best ratio of phosphate and potash for the potato crop? The answer to this can best be determined by extensive field trials. The soil type, system of cropping, and climate are factors which must necessarily be considered. In any case because of the end product, namely, starch, potash in liberal quantities is indispensable. Whether it is supplied through animal manures or commercial carriers is immaterial.

Study Profitable Balance

During the past year a study of the potash-phosphate relationship was undertaken in Barron county, one of the important potato sections in Wisconsin. The soil upon which this study was made is mapped as Colby silt loam, a soil well supplied with liberal amounts of phosphate and potash. Tests for availibility, however, indicate sparing amounts of each. The field had been in hay and pasture for a number of years and received no manure other than the commercials applied alongside the row at planting time. Triumphs were planted on May 31 in three-foot rows, spaced 13″-14″ apart in the row. The crop was harvested on September 19, and considering the abnormal temperatures during the growing season, excellent response to the fertilizers was secured.

The results of the year's work are indicated in the table opposite.

The data are interesting, studying



The 10 extra units of potash in the 3-20-20 served to increase the yield 58.26 bus. above the 3-20-10; and the 6 added units of phosphate in the 3-15-18, 35.79 bus. above the 3-9-18.

pairs of treatments, namely, 3-20-20 with the 3-20-10, and the 3-15-18 with 3-9-18. In the first pair potash is relatively low in the 3-20-10, and in the second phosphate is likewise low in the 3-9-18. The 3-20-20, as will be noted, outyielded the 3-20-10 to the extent of 58.26 bushels, and the 3-15-18 increased the yield over the 3-9-18 by 35.79 bushels. In both cases No. 1's and not total yields are considered. The 10 additional units of potash in the 3-20-20 served to increase the yield, and likewise the six units of phosphate in the 3-15-18 made an appreciable difference. It appears that under the condition of the trial the mixture for best results should contain about the same amount of phosphate as of potash.

It is true that fertilizer cost per acre is higher for the better balanced mixtures. In the case of the 3-20-20 the increased cost amounts to $2.92 per acre for which an extra 58 bushels were secured, and for the 3-15-18, $1.65 for the 35 bushels. Stated differently, increased fertilizer costs of the better balanced rations are 5c. per bushel in the one case, and 4.7c. in the other, surely a profitable investment.

In the table are also indicated the returns per acre above fertilizer costs based upon the cash retail price and assessing 50c. per bushel against No. 1 potatoes. No. 2's some years have a nominal value, but these were not considered in the returns. The highest acre returns, $46.44, were secured with the 3-20-20; and 3-15-18 came a close second, returning $45.58.

The question of economy in the use of fertilizers may be viewed from another angle. Experienced users are quite convinced that high-analysis or

(*Turn to page 25*)

HIGHEST PROFITS RESULTED FROM CORRECTLY BALANCED FERTILIZERS

Treatment	U. S. No. 1's	No. 2's	% No. 2's	Increase No. 1's over Blank	Fertilizer cost per acre	Returns per A. above fert. cost*
Blanks	146.60	14.82	9.18	—	—	—
600 lbs. 3-20-10	216.11	17.32	7.41	69.51	14.52	$20.23
600 lbs. 3-20-20	274.37	14.04	4.86	127.77	17.44	46.44
600 lbs. 4-8-7	228.66	15.83	6.47	82.06	9.70	31.33
600 lbs. 3-15-18	266.24	19.12	6.70	119.64	14.24	45.58
600 lbs. 3-9-18	230.45	14.34	5.85	83.85	12.59	29.33

* Potatoes 50c. per bu., (U. S. No. 1's)

The Inquiring Mind *and the* Seeing Eye

By Dr. A. S. Alexander

University of Wisconsin

WHEN auld Jenny Geddes, of immortal memory, let fly her cutty stool at the head of Dean George Hannay, in St. Giles church, Edinburgh, Scotland, on Sunday, July 16, 1637, and cried "Deil colic the wame o' thee!" she expressed and impressed, emphatically, the protest of the staunch Presbyterians of that day against the reading of the English Collect or Liturgy. Hers was the vigorous objection of the dissenters to the new form of public worship sponsored by Charles I. Of that dour and doughty band were some of the Lyons of Perthshire, of which fine family Thomas Lyttleton Lyon, who has been Professor of Soil Technology at Cornell University for 27 years, is a greatly respected and esteemed descendant.

The name of Lyon is historic and highly regarded in the straths of Forfar and Perth. It is the family name of the Earl of Strathmore and Kinghorne, whose ancestral seat is Glamis Castle in Forfarshire, dating from the 11th century, and the scene of Shakespeare's "Macbeth", who was Thane of Glamis. John Lyon was the first member of the family to inhabit that ancient castle, which Sir Walter Scott in his "Demonology and Witchcraft" called a "hoary old pile," and on which the interest of all Great Britain was centered a few years ago, when from its portals came a charming daughter as the bride of the Duke of York, second son of King George V. And there, some years later was born, to the joy of all loyal Scots, their second daughter, Princess Margaret Rose.

The ancestors of Thomas Lyttleton Lyon, and other members of his persecuted sect, moved from Perthshire to the north of Ireland during the reign of Charles II, and joined the colony there, as Presbyterianism was not opposed. Later, when their religious liberty was assailed, they emigrated to Cumberland county, Pennsylvania, arriving there in 1748. Other members of the Lyon clan joined them in 1763.

In American History

Dr. Lyon's great grandfather, William Lyon, on his mother's side, surveyed the town site of Carlisle, Pa., in 1750, served as a lieutenant in the French and Indian war, and was present at the capture of Fort Duquesne. His cousin, Benjamin Lyon, great grandfather on his father's side and a captain in the Revolutionary War, was a member of the expeditionary forces against Quebec in 1775 and fought in many of the later battles. Among other ancestors were Thomas Savage, who came to Jamestown, Virginia, in 1607, and Nathaniel Lyttleton, who settled in eastern Virginia, in 1635. Lyttleton is a fine old family name in Worcestershire, England.

Another famous representative of

the Lyon clan was Mary Lyon (1797-1840) the founder of Mount Holyoke Female Seminary, a permanent institution consecrated to the training of young women for usefulness and "designed to furnish every advantage which the state of education in this country will allow."

Thomas Lyttleton Lyon was born in Allegheny county, Pennsylvania, February 17, 1869, his father being James B. Lyon and his mother Anna M. Lyon. His boyhood days were spent on the farm and in attending the district schools; then he prepared for college at the Pittsburgh High School, where he became intensely interested in chemistry. In that early day, facilities and equipment for the study of chemistry were comparatively primitive and inadequate; therefore, young Lyon, like Dr. Stephen Moulton Babcock, improvised his own "tools and apparatus." For a laboratory, he fitted up a room over an outside laundry, and there worked to good advantage, as the High School did not offer laboratory instruction as a supplement to its class-room work in chemistry. Thus early in the life, on his father's farm and in the chemistry workshop he devised, the lad who was to become famed as a chemist, agronomist, soil technologist, and "lysimeter expert" learned how to labor and developed the self-resourceful and initiative attributes which were to stand him in good stead throughout life.

DR. T. L. LYON

Naturally, he decided to follow his bent and, therefore, he studied chemistry under Professor G. S. Caldwell, at Cornell University, from 1887 to 1891, until he received the degree of Bachelor of Science in Agriculture. In the autumn of 1891, he was appointed instructor in chemistry at the University of Nebraska and, to familiarize himself with sugar beet cultivation and the manufacture of beet sugar, he spent three months in the beet sugar factories of the State.

That practical experience and his instructional work did not, however, satisfy his insatiable thirst for higher education in chemical science, and so he went to Germany and studied for two semesters under Professor Tollens at the University of Goettingen, where Dr. S. M. Babcock, in 1879, had been an illustrious student. While in Germany, he added to his knowledge of beet sugar manufacture by visiting the factories.

Returning to the University of Nebraska, he worked at the Experiment Station as first assistant and chemist and supervisor of sugar beet experiments, from 1894 until 1895; then he was made Professor of Agriculture in that Institution.

In 1899, he was married to Bertha Laura Clark, daughter of the late John R. Clark, a prominent banker of Lincoln, Nebraska. They have two children, John Lyttleton Lyon and George Clark Lyon.

Obtaining leave of absence from the University of Nebraska, he again studied agricultural chemistry under the direction of Professor Caldwell at Cornell University and earned the degree of Doctor of Philosophy which was conferred upon him in 1904. His thesis, on improvement of the quality of wheat, was published by the Bureau of Plant Pathology of the U. S. Department of Agriculture as Bulletin No. 78. Returning to Nebraska, he continued his research and instructional work until 1906, when he was appointed Professor of Experimental Agronomy in Cornell University, and there took charge of the experiments

in soils and field crop production. At that time, plant breeding was not included in agronomy work, chemistry being the major consideration. In that science he had been well trained, and in addition to that knowledge, he brought to his new position years of experience in field experimentation, which fitted him the better for his duties.

Developed Agronomy

During his years of service in Nebraska, Dr. Lyon found that recurring cycles of dry seasons caused crop failures; therefore, he sought to develop and introduce methods of crop growing better suited to the environment than those of the more humid region of the Eastern States, which had been practiced by the settlers. His experiments with soil management were directed chiefly to the conservation of soil moisture and the introduction and production of crop plants adapted to dry farming. He tested, thoroughly, in various parts of the State, durum wheat, brome grass, Kafir-corn, and several millets introduced by the U. S. Department of Agriculture, together with many other varieties that proved less suitable. The Kherson variety of oat, introduced by the Nebraska Station, was one of the most promising varieties disseminated. His experiments included a study of the changes occurring in the life habits of corn, wheat, and other crops when exposed to new conditions of moisture and temperature. Careful attention was given to the testing of hardier strains of alfalfa than the common one, which had already been grown to a limited extent in Nebraska. In this important undertaking, during most of the time student help was the only assistance available. The results of his painstaking experiments were recorded in 22 bulletins published by the Nebraska Experiment Station.

Agronomy was a new study when Dr. Lyon began work in Nebraska and he had to develop courses and devise laboratory practices for its teaching. The popular laboratory manuel entitled, "Examining and Grading Grains," was published by Dr. Lyon in conjunction with Professor Edward Gerrard Montgomery at that time. His plan of instruction attracted wide attention and was described, along with that of four other agricultural colleges, in Bulletin No. 127 published by the Office of Experiment Stations, U. S. Department of Agronomy, in 1903.

Dr. Lyon had charge of the Dairy Test at the Trans-Mississippi Exposition in Omaha in 1898. One of his constructive accomplishments, while resident in Nebraska, was the development of a secondary school of agricultural instruction trains on the railroads of the State. He also acted for the Bureau of Plant Industry of the U. S. Department of Agriculture as one of the judges of agricultural products at the Louisiana Purchase Exposition at St. Louis, Mo., in 1904, and served as a member of the faculty of the Graduate School conducted by the Association of Agricultural Colleges and Experiment Stations at Urbana, Ill., in 1906, again at Ithaca, N. Y., in 1908, and at Lansing, Mich., in 1911.

Called to Cornell

In 1906 Dr. Lyon was called to Cornell University as Professor of Experimental Agronomy, to take charge of experimental work in soils and field crop production. There he quickly discovered that the agronomic problems to be solved in the New York State environment were materially different from those presented in Nebraska and required an entirely new outlook and program. The measurement of soil fertility losses and methods for their control required immediate consideration; therefore, experimentation to that end was actively conducted.

The use of the lysimeter was decided upon as the most likely means of accomplishing the desired results, and

(*Turn to page* 27)

Lambs on alfalfa pasture at Michigan State College—September, 1932.

Fertilize Alfalfa Then Pasture It

By H. C. Rather

Head of the Department of Farm Crops, Michigan State College.

IN 1919 Michigan farmers grew 74,000 acres of alfalfa. In 1932 the Michigan alfalfa acreage had climbed to 750,000, having increased to more than 10 times the 1919 acreage. During that time, Michigan growers have demonstrated to their own satisfaction that alfalfa is not only the best of roughages for all classes of livestock, but that under many conditions it is without a peer as a pasture crop, if properly fortified by plant-food reserves in the soil, so that it can withstand competition from other plants and the impairment of continuous grazing.

For some years now, the Michigan State College has been conducting pasture experiments with dairy cows and sheep on its W. K. Kellogg Farm near Augusta, Michigan, in cooperation with the Division of Forage Crops and Diseases of the U. S. Department of Agriculture. A. B. Dorrance of the U. S. Department is locally in charge.

The first thing we learned was that alfalfa needed to have plenty of food in the soil. With that provided, alfalfa immediately showed up as a more valuable pasture crop than either sweet clover or excellent stands of permanent grass.

The soil on the particular field where the dairy cow experiments were carried on is a Fox sandy loam. In 1929, when the alfalfa was seeded, it was in a rather low state of fertility.

(*Turn to page* 30)

Profitable Cotton

By G. Chalmers McDermid

Charleston, South Carolina

A YIELD of 9¾ bales of cotton, each weighing slightly over 500 pounds from 5 acres is a mighty good crop of cotton any year. It showed a profit with cotton at five cents per pound. Harry Inabinett of Woodford, Orangeburg county, South Carolina, who claims he is nothing, if not an average farmer, explains how he secured this yield last year.

"I did it by selecting my soil, and putting down plenty of the right kind of plant foods to make the crop. I have been using lots of potash for the last few years, because of the prevalence of cotton rust in my neighborhood, and everywhere I go in my State. From what I learned from our State Agricultural College and from others, I found out that cotton rust was due in a large measure to lack of available potash in the soil. Now, from my own experience, I can make the unqualified statement, that potash controls cotton rust.

Tried It on Own Farm

"Just to prove that I was right about this potash idea, I placed a two-acre test in the center of my five-acre field. One of these acres I top-dressed with 100 pounds of sulphate of ammonia, and the other with the same amount of ammonia and 200 pounds of high-grade kainit (20%). At all times during the season, I could notice a slight difference in favor of the potash acre, but this difference was very marked during early September and from then on. When the final weights of the two acres were totaled, my ammonia acre gave me 2,324 pounds of seed cotton, and my potash and ammonia acre gave me 2,726 pounds, a difference of 402 pounds of seed cotton for the expenditure of a sack of 20% kainit.

"As stated before, the difference in the two acres was quite marked. There were more bolls on the potash acre. These bolls were larger, opened better, and picked cleaner. The plants kept their leaves and remained green longer than on many acres which I saw about that time of the year. (This was true of both plots, because I had 900 pounds of 4-8-4 (NPK) per acre under the crop.)

Nearly Two Bales per Acre

"My 1932 crop was not as large as was my 1931 crop, but this I think was due to extremely dry weather at planting time. Lack of moisture gave me poor germination and stand. I had to supply the missing places as late as May 20th. These replants, however, came through the summer in fine style and gave me a good crop, although I lost one entire picking from frost. Any year that I can make nearly ten bales on five acres I am satisfied, and it will take more than just a depression to make me stop planting cotton.

"There are thousands of acres of cotton in my county and in my State that have suffered from cotton rust for a good many years, and I feel sure that the addition of 200 pounds of 20% kainit next summer in a top-dresser, or the putting down of a fertilizer analyzing about 4% ammonia, 8% phosphorus and 8% to 10% potash will put many of those fields back into balance, and make better crops of cotton on smaller acreages."

Pictorial

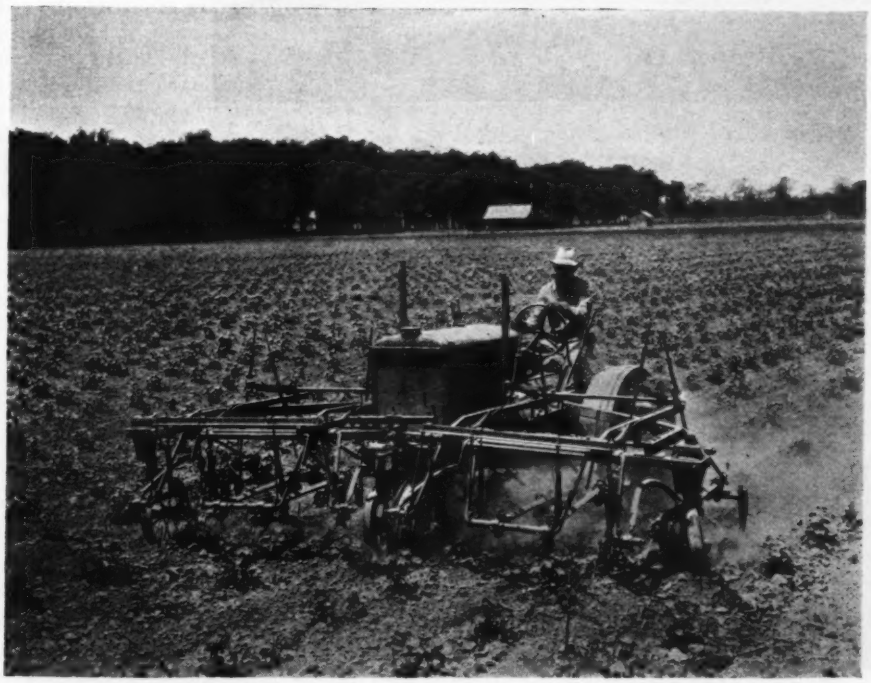
ON THE SUNNY SIDE OF THE STACK.

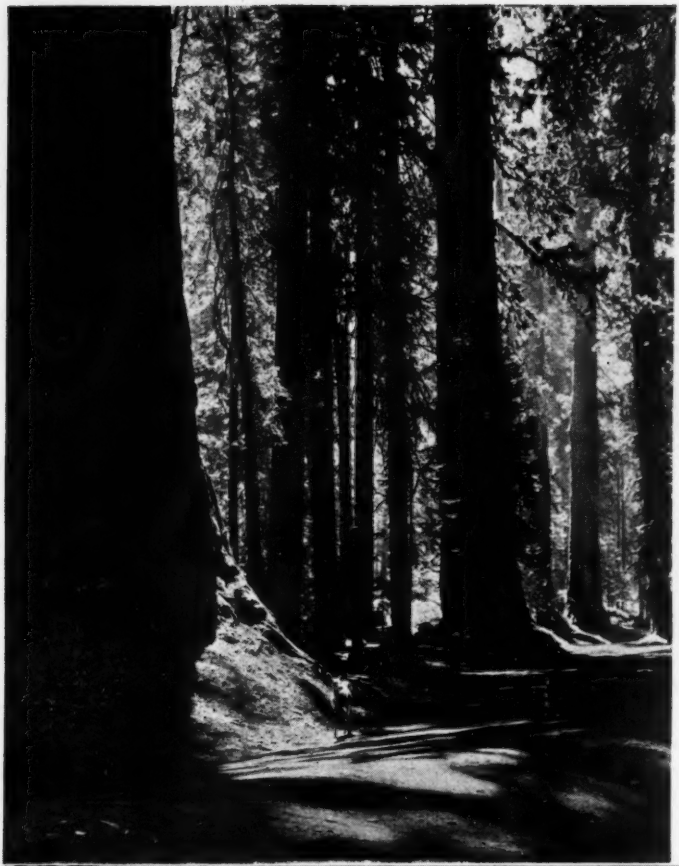
Above: Flooding a rice field on the farm of Virgil Hall, DeWitt, Arkansas.

Below: With many tractors laid by, there is a brisk demand for horses like these this spring.

Above: Perfect team-mates enjoy their leisure as well as their work together.

Below: Plowing cotton on the J. T. Fargason and Son plantation near Clover Hill, Mississippi.





Left: Giant Sequoia trees of California in Sequoia National Park.

Below: A cypress swamp near Scott, Arkansas.

The Editors Talk

Efficiency in Fertilizer Usage

The important fertilizer problem at present is how to get the most profitable results from the use of fertilizers on the farm. A vast amount of research and experimental work by State and Federal authorities is being conducted to this end. Among such projects is the problem of the best method of applying fertilizers for different crops.

In 1925, a Joint Committee on Fertilizer Application was formed of representatives from four national organizations, namely, American Society of Agricultural Engineers, American Society of Agronomy, National Association of Farm Equipment Manufacturers, and National Fertilizer Association. It was organized at the suggestion of Director Jacob G. Lipman of the New Jersey Agricultural Experiment Station, and is still carrying on its work. Its purpose was and still is to study the problems that are involved in applying fertilizers to different crops on different soils, to compare different methods, and to recommend those that give most efficient results.

Before this committee was organized, and beginning in 1919, the National Fertilizer Association financed a number of research studies at various experiment stations for the purpose of obtaining accurate information with respect to both fertilizer placement and machine design. Among the more outstanding results it has been found that to broadcast fertilizers is not always the most profitable method. Great improvement in fertilizer distributors and in the results obtained from fertilizers has been made.

Recently H. R. Smalley, Chief Agronomist of the National Fertilizer Association, has written a detailed account of the progress of the work, giving recommendations for the application of fertilizers to different crops. This account has been published in the agricultural press and should be read by all farmers interested in the efficient application of fertilizer.

It is very important to study a new combination fertilizer-planter before buying it. The desirable points about the machine are given in the report and are very practical. Certainly the Joint Committee on Fertilizer Application has accomplished excellent results. Yet there is much more to be done.

In addition to the report by Mr. Smalley, other agencies have published valuable material. Among them, is a report on the machine placement of fertilizers applied to snap beans in Florida by G. A. Cummings and A. L. Sharp of the Bureau of Agricultural Engineering, United States Department of Agriculture. This contains very practical information, including photographs of machinery involved and of the effects of different fertilizer placements.

Along the same line it is noted in the publication of the Department of Commerce, "World Trade Notes on Chemical and Allied Products," that an International Fertilizer Application Committee is proposed. In fact, an International Conference on the Application of Fertilizers was held in Rome in November, 1932, under the auspices of the International Federation of Agricultural Districts. They approved a movement to constitute an international organ for promoting the use of chemical fertilizers. A temporary committee

including French, German, and Italian delegates was formed to work out a proposed International Institute and make a report. Thus, it is possible that the work at present being conducted in the United States may yet have a larger and more important influence.

The Value of Research

In association with two State universities, Purdue University, Indiana, and the University of California, reports on the purpose and value of research recently have been published.

The Purdue Research Foundation held its Third Industrial Research Conference at Purdue University at the end of last year. As stated by G. Stanley Meikle, at this conference an attempt was made to indicate and to evaluate the research activities on the Purdue Campus during the last few decades. The State began to appropriate funds to Purdue in 1870. In 63 years it has appropriated slightly more than $29,000,000 for all purposes, principally educational. It is conservatively estimated that the material wealth of the State is being increased each year by almost twice this amount. "The primary purpose of the Purdue Research Foundation is to cooperate with industry in the solution of pure and applied scientific research problems which are adequately subsidized, to the end that the Foundation, the University Staff member, the Graduate Research Student, and industry itself shall be mutually and substantially benefited."

The report by the University of California is entitled "How California Agriculture Profits by Economic Research" and refers particularly to the facilities offered by the Giannini Foundation which has been organized as an integral part of the College of Agriculture, coordinating resident teaching, research, and extension activities relating to all phases of agricultural economics. In view of the changed economic order throughout the world and the necessity for agricultural adjustments within the State and Nation which have confronted California farmers in recent years with an entirely new category of problems, it is believed that fact-finding economic studies are of the utmost importance.

It is very encouraging that in these hard times the real value of research is being appreciated. And it is particularly encouraging that forces outside of the Universities themselves recognize this value and are taking practical and encouraging steps for the mutual benefit of their respective States.

Dressed Up

The American Potato Journal published by the Potato Association of America with the March issue appears in an improved form. The cover design has been altered, the type face changed, and the magazine now appears with an editorial on the first page. The articles contained in the March issue are of much practical interest. There is one by B. E. Brown of the Bureau of Chemistry and Soils, U. S. Department of Agriculture, on the results obtained from the use of concentrated fertilizers on potatoes on three important soil types. Another article, by John S. Gardner of the University of Kentucky, presents a comparison of the tuber-unit and tuber-index methods of potato improvement. Trends in potato production and marketing are noted by W. Stuart of the Bureau of Plant Industry, U. S. Department of Agriculture. Crop market news and sectional notes covering the important potato-growing centers complete the issue.

The editors are to be congratulated on giving all interested in potato production such a practical and well-edited magazine.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, and Crops. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Potato growers, especially those on the southern Coastal Plain, will be interested in North Carolina Agricultural Experiment Station Bulletin 283, "Results of Five Years' Fertilizer Experiments With Irish Potatoes in Eastern North Carolina," by C. B. Williams, H. B. Mann, and J. J. Skinner. Space does not permit a discussion here of the many pertinent phases of the subject covered by this work. General conclusions indicate that under the conditions of this experiment, best results were obtained with one ton of a fertilizer containing about 18 units of plant food in approximately a 1-1-1 ratio. The potash could be derived from the muriate form and a combination of organic and inorganic nitrogen carriers should be used to supply the nitrogen.

"The Comparative Effect of Muriate and Sulfate of Potash on the Composition and Quality of White Burley Tobacco" by P. E. Karraker (Kentucky Agricultural Experiment Station Bulletin 334) shows that for this type of tobacco small amounts of chlorine may be contained in the fertilizer without seriously damaging the crop. Tests conducted over a period of six years showed that chlorine in the fertilizer increased the chlorine content of the tobacco. However, this increase did not become serious until 50 or 100 pounds per acre of muriate of potash were used. Sulfate of potash in increasing amounts increased the sulphur content of the tobacco. However, the increases were comparatively small compared to the increase in chlorine content with muriate of potash and did not become serious until 400 to 800 pounds per acre of sulfate of potash had been applied. Burning tests and commercial grading of the muriate and sulfate-fertilized tobacco showed in general that sulfate of potash produced a higher quality leaf, but indicated that small amounts of muriate of potash could be used without particularly injurious effects. It would be concluded from this work that sulfate of potash probably should furnish the bulk of the potash in the fertilizer for burley tobacco, but that muriate of potash could be used to supply part of the potash, provided that not over 25 or at the most 50 pounds per acre of chlorine would be applied by the fertilizer. It scarcely need be mentioned that this tolerance of burley tobacco for chlorine does not apply to the other types of tobacco.

"State Laboratory Fertilizer Report, Seed Report, July-December, 1932, Feeds and Miscellaneous, January-December, 1932," State Bd. of Agr., Dover, Del., Quar. Bul. Vol. 22, No. 4.

"Annual Report of the State Chemist of Florida for the Year Ending December 31, 1932," Dept. of Agr., Tallahasse, Fla., J. J. Taylor.

"Official Inspections 145—Commercial Fertilizers, 1932," Agr. Exp. Sta., Orono, Me., Oct., 1932, James M. Bartlett.

"Commercial Fertilizers, Commercial Feeds and Agricultural Liming Materials," Univ. of Md., College Park, Md., Control Series, No. 146, Jan., 1933.

"The Story of Field A of the Massachusetts

Agricultural Experiment Station—A Review of Experiments With Nitrogen Fertilizers," Agr. Exp. Sta., Amherst, Mass., Bul. 290, Nov., 1932, Fred W. Morse.

"Inspection of Agricultural Lime Products," Agr. Exp. Sta., Amherst, Mass., Control Series, Bul. 66, Dec., 1932, H. D. Haskins.

"County Fertilizer Data: Mixed Goods and Materials," State Dept. of Agr., Jackson, Miss., Season, 1932, January to July 1.

"Third Annual Fertilizer Report of New Mexico Field & Fertilizer Control Office State College, New Mexico," N. M. Col. of Agr., State College, N. M., March 1, 1933, F. E. Oakes.

"The Effect of Certain Mineral Elements on the Color and Thickness of Onion Scales," Agr. Exp. Sta., Ithaca, N. Y., Bul. 552, Jan., 1933, J. E. Knott.

"Effects of Fertilizers and Rotation on Earliness and Total Yields of Tomatoes," Agr. Exp. Sta., Geneva, N. Y., Bul. 619, Feb., 1933, Charles B. Sayre.

"Report of Analyses of Commercial Fertilizers Sold in New York State, July 1, 1931 to June 30, 1932," Dept. of Agr. & Markets, Albany, N. Y., Agr. Bul. 269, Nov., 1932.

"Home-Mixing of Fertilizers," Clemson Agr. Col., Clemson College, S. C., Cir. 126, Jan., 1933, R. W. Hamilton.

"Inspection of Fertilizers," Agr. Exp. Sta., Kingston, R. I., Ann. Fert. Cir., Sept., 1932, W. L. Adams and A. S. Knowles, Jr.

"Fertilizer Experiments with Cotton," Agr. Exp. Sta., College, Sta., Tex., Bul. 469, Dec., 1932, E. B. Reynolds, G. T. McNess, R. A. Hall, P. R. Johnson, R. H. Stansel, Henry Dunlavy, P. B. Dunkle, and H. F. Morris.

"The Use of Fertilizers for Washington Soils," State Col. of Wash., Pullman, Wash., Ext. Bul. 176, Jan., 1933.

"Commercial Fertilizers—1933," Dept. of Agr. & Markets, Madison, Wis., Bul. 142, Feb., 1933, W. B. Griem.

Soils

The large losses in soil moisture and especially in nutrients from soil erosion and methods to reduce or control this erosion are given by M. F. Miller and H. H. Krusekopf in Missouri Agricultural Experiment Station Research Bulletin 177, "The Influence of Systems of Cropping and Methods of Culture on Surface Runoff and Soil Erosion." This bulletin brings up to date the well-known erosion experiments begun at this Experiment Station in 1917. Bluegrass sod has been found most effective in preventing erosion, followed by a corn, wheat, and clover rotation. Continuous wheat allowed somewhat more erosion, while continuous corn permitted the most erosion of all the cropping systems studied. The greatest losses, however, were on the plowed and fallowed plots.

An interesting comparison was made of the erosion from two plots in corn. One plot had been growing corn continuously, while the other had corn growing in a rotation with wheat and clover. Much less erosion occurred from the corn ground in the rotation than from the ground growing corn continuously. The authors say: "It is evident that the influence of good crop rotation in controlling erosion is not entirely due to the larger portion of the time when crops covered the ground but also to the influence of the rotation on the soil itself." The effectiveness of soybeans in controlling erosion was also investigated. It was found that soybeans grown in rows and cultivated were apparently no more effective than continuous corn in controlling erosion. Soybeans grown in eight-inch drill rows were a much more effective control. This bulletin deals primarily with surface or sheet erosion. The losses and damage from this type of erosion are not so noticeable or spectacular as those from gullying, but they are nevertheless great. Surface erosion removes the top soil, the most fertile part of the farm, resulting in decreased yield or crop failure. The work represented by this bulletin is of great value to all farmers and warrants their attention.

"Soils of Georgia," Univ. of Ga., Athens, Ga., Ext. Cir. 237, Jan., 1933, M. W. Lowry.

"Electric Soil and Hotbed Heating," Agr. Exp. Sta., Moscow, Idaho, Cir. 68, Oct. 1932, Hobart Beresford.

"Studies on the Biological Decomposition of Peat," Agr. Exp. Sta., East Lansing, Mich., Tech. Bul. 129, Dec., 1932, R. M. Snyder and Z. N. Wyant.

"Soils in Relation to Fruit Growing in New York—Part I. A Detailed Soil Survey of the Hilton Area, Monroe County," Agr. Exp. Sta., Ithaca, N. Y., Bul. 541, July, 1932, A. T. Sweet and Joseph Oskamp.

"A Survey of Ohio Orchard Soils Relative to Phosphorus Distribution and Acidity," Agr. Exp. Sta., Wooster, Ohio, Bul. 517, Jan., 1933,

J. H. Gourley and R. M. Smock.

"Soil Survey of Caroline County, Maryland," U. S. D. A., Washington, D. C., Series 1929, No. 7, H. B. Winant and S. R. Bacon.

"Soil Survey of Talbot County, Maryland," U. S. D. A., Washington, D. C., Series 1929, No. 8, S. O. Perkins and Merle Hershberger.

"Soil Survey of Hampden and Hampshire Counties, Massachusetts," U. S. D. A., Washington, D. C., Series 1928, No. 25, W. J. Latimer and L. R. Smith.

"Soil Survey of Branch County, Michigan," U. S. D. A., Washington, D. C., Series 1928, No. 23, J. W. Moon, Robert Wildermuth, J. O. Veatch, C. H. Wonser, B. E. Musgrave, and J. A. Porter.

"Soil Survey of The Fort Sumner Area, New Mexico," U. S. D. A., Washington, D. C., Series 1930, No. 1, A. T. Sweet and E. N. Poulson.

"Soil Survey of Ottawa County, Ohio," U. S. D. A., Washington, D. C., Series 1928, No. 26, A. H. Paschall, J. G. Steele, G. W. Conrey, and S. W. Phillips.

Crops

The spring season brings into circulation a large number of excellent publications on different crops and their profitable adaptability to the respective States. In the list below will be noted pamphlets on such specialized crops as pecans, the soybean, spinach, Ladino clover, chicory, peanuts, grazing crops for poultry, blueberries, mushrooms, blackberries, and others. Several of these indicate the increasing demand of producers for information on crops with which to tempt more consumer dollars.

"Annual Report Extension Service," Univ. of Ark., Little Rock, Ark., Ext. Cir. 302, Jan., 1933.

"Annual Report of the Director for the Fiscal Year Ending June 30, 1932," Agr. Exp. Sta., Newark, Del., Bul. 179, Dec., 1932, C. A. McCue.

"Alfalfa Production in Delaware," Univ. of Del., Newark, Del., Ext. Bul. 18, Mar., 1933, Henry C. Harris and C. E. Phillips.

"Annual Report For the Fiscal Year Ending June 30, 1932," Agr. Exp. Sta., Gainesville, Fla., Wilmon Newell.

"Grading, Packing and Stowing Florida Produce," Agr. Exp. Sta., Gainesville, Fla., Bul. 254, Oct., 1932, M. R. Ensign.

"Twelfth Annual Report 1931," Coastal Plain Exp. Sta., Tifton, Ga., Bul. 19, June, 1932, S. H. Starr.

"Propagation of Pecans," Exp. Sta., Experiment, Ga., Bul. 172, Nov., 1932, J. E. Bailey and J. G. Woodruff.

"Cotton for Georgia, 1932," Univ. of Ga., Athens, Ga., Ext. Cir. 211, Jan., 1933, E. C. Westbrook.

"Extension Work in Athens District, 1932," Univ. of Ga., Athens, Ga., Ext. Cir. 214, Jan., 1933, Lula Edwards.

"Landscape Gardening in Georgia," Univ. of Ga., Athens, Ga., Ext. Cir. 215, Jan., 1933, H. W. Harvey.

"County Agents Activities in Northwest Georgia," Univ. of Ga., Athens, Ga., Ext. Cir. 217, Jan., 1933, L. F. Skinner.

"Horticultural Efforts in Georgia, 1932," Univ. of Ga., Athens, Ga., Ext. Cir. 230, Jan., 1933, George H. Firor.

"A Year's Progress in Solving Farm Problems of Illinois, 1931-32," Agr. Exp. Sta., Urbana, Ill., H. W. Mumford.

"Genetics and Breeding in the Improvement of the Soybean," Agr. Exp. Sta., Urbana, Ill., Bul. 384, Nov., 1932, C. M. Woodworth.

"Spinach, Early and Late," Agr. Exp. Sta., Urbana, Ill., Cir. 404, Feb., 1933, J. W. Lloyd.

"Wild Garlic and Its Control in Indiana," Purdue Univ., Lafayette, Ind., Ext. Leaflet 167, Jan., 1933, C. E. Skiver.

"Report of Agricultural Research For the Year Ending June 30, 1932," Agr. Exp. Sta., Ames, Iowa, C. F. Curtiss.

"Building Iowa's Agriculture," Ia. State Col. of Agr., Ames, Ia., Annual Report 1931, Ext. Serv., R. K. Bliss.

"Program of Sugar Cane Production for South Louisiana 1932-1933," La. State Univ., Baton Rouge, La., Ext. Cir. 151, Jan., 1933.

"Maine Extension Service Annual Report for the Year Ending June 30, 1932," Univ. of Me., Orono, Me., Ext. Bul. 209, Jan., 1933, Arthur L. Deering.

"How to Grow Rhubarb," Mass. State Col., Amherst, Mass., Ext. Leaflet 46, Rev., Jan., 1933, Paul W. Dempsey.

"How to Grow Spinach," Mass. State Col., Amherst, Mass., Ext. Leaflet 99, Rev., Jan., 1933, Paul W. Dempsey.

"Pruning Young Fruit Trees," Mass. State Col., Amherst, Mass., Ext. Leaflet 109, Rev., Dec., 1932, J. K. Shaw.

"Ladino Clover," Mass. State Col., Amherst, Mass., Ext. Leaflet 144, Oct., 1932, Ralph W. Donaldson.

"Chicory—Its Culture and Uses," Mich. State Col., East Lansing, Mich., Ext. Bul. 127, Nov., 1932, H. C. Rather.

"Field Studies of Bud Sports in Michigan Tree Fruits," Agr. Exp. Sta., East Lansing, Mich., Tech. Bul. 130, Dec., 1932, Brooks D. Drain.

"The Quarterly Bulletin," Agr. Exp. Sta., East Lansing, Mich., Vol. XV, No. 3, Feb., 1933.

"A Well Planned Farm Business," Univ. of Minn., St. Paul, Minn., Spec. Bul. 155, Nov., 1932, S. B. Cleland.

"The Agricultural Extension Service, Missouri College of Agriculture; Annual Report for 1932," Univ. of Mo., Columbia, Mo., Cir. 302, Jan., 1933, R. R. Thomasson.

"Factors Causing Cull Apples in Missouri," Agr. Exp. Sta., Columbia, Mo., Bul. 319, November, 1932, G. C. Schowengerdt and D. C. West.

"Eight Years' Work by the Montana Grain Inspection Laboratory, July 1, 1923 to June 30, 1931," Agr. Exp. Sta., Bozeman, Mont., Bul. 270, Jan., 1933, Clyde McKee, W. O. Whitcomb, W. D. Hay, and D. M. Feese.

"Improving Pastures," Univ. of Me., Orono, Me., Cir. 111, Jan., 1933, R. F. Talbot.

"Facts About 36 Varieties of Peaches," Agr. Exp. Sta., New Brunswick, N. J., Cir. 262, Dec., 1932, M. A. Blake.

"Forty-fifth Annual Report 1932," Agr. Exp. Sta., Ithaca, N. Y., Cornelius Betten.

"Cherry Growing in New York," N. Y. State Col. of Agr., Ithaca, N. Y., Cornell Ext. Bul. 246, Nov., 1932, G. W. Peck.

"Soils in Relation to Fruit Growing in New York—Part II: Size, Production, and Rooting Habit of Apple Trees on Different Soil Types in the Hilton and Morton Areas, Monroe County," Agr. Exp. Sta., Ithaca, N. Y., Bul. 550, Rev., Dec., 1932, Joseph Oskamp and L. P. Batjer.

"The Value of Crop Rotation in The Coastal Plain Area," Agr. Exp. Sta., State Col. Sta., Raleigh, N. C., Bul. 280, Jan., 1933, R. H. Rogers and H. B. Mann

"Approved Practices for Peanut Growers," Agr. Exp. Sta., State Col. Sta., Raleigh, N. C. Bul. 281, Jan., 1933, B. F. Fulton, P H. Kime, S. G. Lehman, and H. B. Mann.

"Grazing Crops for Poultry," Agr Exp. Sta., State Col. Sta., Raleigh, N. C., Bul. 282, Feb., 1933, R. S. Dearstyne and P. H. Kime.

"A Study of the Ash Constituents of Apple Fruits During the Growing Season," Agr. Exp. Sta., Wooster, Ohio, Bul. 519, Feb., 1933, E. F. Hopkins and J. H. Gourley.

"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XVIII, No. 2, March-April, 1933.

"Wheat Varieties for the Columbia River Basin of Oregon," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 308, Dec., 1932, D. E. Stephens, R. B. Webb, and J. F. Martin.

"Annual Report of the Director For the Fiscal Year Ending June 30, 1932," Agr. Exp. Sta., Brookings, S. D., J. W. Wilson.

"Alfalfa Production Under Irrigation in Western Texas," Agr. Exp. Sta., Col. Sta., Tex., Bul. 472, Dec., 1932, John J. Bayles.

"Good Gardening—VII—Commercial Fertilizers," Univ. of Vt., Burlington, Vt., Emergency Leaflet No. 9, April, 1933.

"Vegetable Planting and Yield Data," Univ. of Vt., Burlington, Vt., Brieflet No. 313, Feb., 1931.

"Department of Agriculture Immigration of Virginia," Dept. of Agr., Richmond, Va., Buls. 302 and 303, March and April, 1933.

"Observations and Experiments with Blueberries in Western Washington," Agr. Exp. Sta., Pullman, Wash., Bul. 276, Jan., 1933, D. J. Crowley.

"Garden Plan for a Family of Five," State Col. of Wash., Pullman, Wash., Ext. Cir. 19, March, 1933, C. L. Vincent.

"Report of the West Virginia Agricultural Experiment Station for the Biennium Ending June 30, 1932," Agr. Exp. Sta., Morgantown, W. Va., Bul. 254, Dec., 1932, F. D. Fromme.

"Forty-second Annual Report of the University of Wyoming, 1931-1932," Agr. Exp. Sta., Laramie, Wyo., J. A. Hill.

"Experiments in Wheat Production on the Dry Lands of Oregon, Washington, and Utah," U. S. Dept. of Agr., Washington, D. C., Tech. Bul. 329, Nov., 1932, David E. Stephens, H. M. Wanser, and Aaron F. Bracken.

"Rotation and Tillage Experiments at the Lawton (Okla.) Field Station, 1917-1930," U. S. Dept. of Agr., Washington, D. C., Tech. Bul. 330, Nov., 1932, W. M. Osborn,

"Red-clover Seed Production in the Intermountain States," U. S. Dept. of Agr., Washington, D. C., Leaflet No. 93, Dec., 1932, E. A. Hollowell.

"Mushroom Growing in the United States," U. S. Dept. of Agr., Washington, D. C., Cir. 251, Dec., 1932, Edmund B. Lambert.

"Roses for the Home," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 750, Rev., Dec., 1932, Furman Lloyd Mulford.

"Sweetpotato Growing," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 999, Rev., Dec., 1932, Fred E. Miller, J. H. Beattie, and H. H. Zimmerley.

"Blackberry Growing," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 1399, Rev., Dec., 1932, George M. Darrow.

"List of Publications of the United States Department of Agriculture From January, 1926, to December, 1930, Inclusive," U. S. Dept. of Agr., Washington, D. C., Misc. Publ. 153, Mabel G. Hunt.

Economics

With a series of circulars, Iowa is keeping her agricultural readers informed on the present agricultural emergency. The first circular, No. 139, "The Situation Today," by A. G. Black, presented the main facts of the case. No. 140, "The Causes of the Emergency," by Geoffrey Shepherd, dealt with the causative factor. The third, No. 141, by Theodore W. Schultz and A. G. Black, discussed "The Voluntary Domestic Allotment Plan." Circular No. 142, the fourth in the series, was entitled "Iowa Farm Mortgage Situation," and its authors were William G. Murray and Ronald C. Bentley. Circular No. 143, "Control of the General Price Level," by Geoffrey Shepherd and Wallace

Wright, is the fifth in the series. Undoubtedly these well-presented studies are eagerly sought by agriculturists endeavoring to obtain a clear picture of the situation.

"An Economic Study of the Agriculture of the Connecticut Valley—5. Factors Affecting the Prices and Acreages of Cigar Tobacco in the United States," Agr. Exp. Sta., Storrs, Conn., Bul. 180, June, 1932, H. B. Boyd.

"Results of Farm Management Extension Work, 1932," Univ. of Ga., Athens, Ga., Ext. Cir. 231, Jan., 1933, Kenneth Treanor.

"A Review of the Accuracy and Timeliness of Outlook Statements," Agr. Exp. Sta., Moscow, Idaho, Cir. 62, Dec., 1932, C. O. Youngstrom.

"Agricultural Outlook for Illinois 1933," Agr. Exp. Sta., Urbana, Ill., Cir. 402, Feb. 4, 1933.

"Organization and Management of Maryland Farms—Piedmont Plateau Region," Agr. Exp. Sta., Col. Park, Md., Bul. 337, Sept., 1932, S. H. DeVault and Ray Hurley.

"Economic Efficiency of the Farm Layout in Maryland," Agr. Exp. Sta., Col. Park, Md., Bul. 338, Oct., 1932, A. B. Hamilton and S. H. DeVault.

"Growth and Decline of Farm Trade Centers in Minnesota, 1905-1930," Agr. Exp. Sta., Univ. Farm, St. Paul, Minn., Bul. 287, July, 1932, C. E. Lively.

"The New York State 1933 Agricultural Outlook," N. Y. State Col. of Agr., Ithaca, N. Y., Cornell Ext. Bul. 251, Feb., 1933, V. B. Hart, M. C. Bond, and Others.

"Cooperative Purchasing and Marketing Organizations in New York State," Agr. Exp. Sta., Ithaca, N. Y., Bul. 544, Oct., 1932, F. A. Harper.

"An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929," Agr. Exp. Sta., Ithaca, N. Y., Bul. 549, Dec., 1932, F. F. Hill.

"The Agricultural Outlook for 1933," Ohio State Univ., Columbus, Ohio, No. 62, Feb., 1933.

"An Economic Study of Sumter County Agriculture," Agr. Exp. Sta., Clemson College, S. C., Bul. 288, Jan., 1933, W. C. Jenssen, B. A. Russell, and Marvin Guin.

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Balanced Food for Potatoes

(*From page 9*)

double-strength fertilizers are more profitable than the equivalent amounts of plant food contained in low-grade mixtures. This question was discussed by the writer in the July, 1930, issue of "Better Crops with Plant Food." Likewise it may be assumed that a well-balanced combination will result in larger profits than unbalanced ones. In this paper the advantage of better-balanced combinations is pointed out. Good practices would, therefore, dictate that if the fertilizer bill must be reduced it should come through using smaller amounts per acre of a well-balanced mixture. In another trial during the past year it was found that an application of 400 lbs. of a 3-15-18 outyielded 600 lbs. of the 3-9-18. Space does not permit incorporating the entire details of this particular experiment.

Under the conditions prevailing over a large area of the Wisconsin potato section it appears that the phosphate content should equal approximately that of potash. Both should be relatively high, particularly the potash content. Such ratios as 1-6-6, 1-4-5, and 1-5-6 represent fairly well-balanced combinations. Fertilizers now licensed similar to the 4-16-20, 3-20-20, and 3-15-18 are ones which may be recommended. The 4-8-7 was a standard in the Eastern States for some years and was also the principal mixture used by Wisconsin growers four or five years back. This mixture represents approximately a 1-2-2 ratio and has been replaced in a large measure by the higher potash carriers as a result of six years of experimental work. The 1932 results are in harmony with those secured in past years.

Potash Fertilizers Improve Quality *of* Canning Peas

POTASH improves the quality of canning peas.

Such are the findings from careful experiments conducted by the University of Wisconsin during the past two years in commercial pea-growing sections of this State. It was previously found by F. L. Musbach of the Experiment Station staff that yields of canning peas often can be greatly increased by the use of commercial fertilizers.

During the past two years attention was particularly directed to a careful determination of the effects of various kinds of fertilizers, applied at the uniform rate of 300 pounds per acre, on the quality of the peas canned from the different experimental fields. The canned peas from different plots were scored by skilled pea graders. The peas came from fields in two different sections of the State, one near Ripon in eastern Wisconsin and the other near Colby in the central portion of the State.

The soil at Ripon is a Miami silt loam. The addition of straight superphosphate (0-16-0) had considerable effect on the quality, but the use of nitrogen and potash still further improved the quality.

On the Colby silt loam soil, superphosphate alone decreased the quality, but generally increased the yields. When potash and nitrogen were added to the phosphate here, the quality almost uniformly increased with additional proportional amounts of potash; all mixtures being applied at the rate of 300 pounds per acre.

The peas from the two areas were scored as follows:

Fertilizer Treatment	Average Score at Ripon	Average Score at Colby
Blank (check)	79.3	82.9
0-16-0 (NPK)	87.3	79.4
0-16-8	86.0	82.2
2-16-4	93.2	83.5
2-16-8	91.7	84.8
2-16-12	88.7	83.0
2-16-16	95.0	85.2

It was definitely found that complete fertilizers (NPK) can increase yields sufficiently to pay for the cost of such fertilizers, besides raising the quality of the peas produced, which will usually sell at a premium. It is concluded that pea growers need have no fear of using potash on their farms, for it seems to have a definite beneficial effect upon the quality of canned peas.
—*L. Van Bossche*

Potash Tripled Cotton Yield

(*From page 7*)

the potash used. I received an average of 6 to 6½ cents a pound for my cotton from the fertilized field and an average of 1½ cents per pound less from that where no potash was used, this being due to the shorter staple and the inferior quality of it.

Because of the small, knotty bolls I found it much more difficult, of course, to pick this unfertilized cotton. The pickers didn't want to pick it and wouldn't do so as long as they could help it. I paid 30c per 100 pounds for picking where the potash was ap-

plied and had to pay 40c where it wasn't, thus making it cost me 10c per 100 more for the picking, and the pickers made less per day.

From the time the cotton was about two weeks old, that which was growing on the land receiving potash was more thrifty and grew off better. The stalks grew to an average of three times as large where the potash was applied as where none was used.

On our type of soil it is absurd to try to grow cotton without potash, and it has been my experience that 200 pounds of the 20 per cent kainit will, on an average, double the yield and frequently triple it.

Erosion Tolls 21 Times That of Annual Crops

The plant food removed from the fields and pastures of America every year by erosion is at least twenty-one times more than that removed by the crops harvested, says the United States Department of Agriculture.

The plant food taken by crops can be restored in the form of fertilizer, but that taken by erosion can not be restored, because this ruinous process takes the whole body of the soil, plant food and all. Land impoverished strictly by plant-food depletion, as sometimes results from continuous growing of the clean-tilled crops, is not worn-out land; the only worn-out land is that which has been so badly washed by erosion that it would be entirely futile to undertake its reclamation. Such land is lost to agriculture.

The Inquiring Mind

(*From page* 12)

Dr. Lyon in 1908 devised and directed the building of the battery of lysimeters which for nearly a quarter of a century has been in constant, profitable service at Cornell. This initial installation of lysimeters led to their use in other experiment stations of the country, where similar work is carried on.

By use of the lysimeter is measured the amount of water that percolates through a given depth of soil. Such determination provides valuable data on soil conditions; but Dr. Lyon has been more concerned in finding, by analysis of the drainage water, the amount of plant food lost by leaching from the soil under known cropping systems. In the lysimeter method, a small block of soil, entirely isolated by appropriate means from the soil surrounding it, is used. Effective and thorough drainage is provided. The advantages of the method are that the variations found in a large field are avoided; the work of carrying on the study is not as great as in a large field; and the experiment is more easily controlled.

The celebrated sets of lysimeters established by Lawes and Gilbert at Rothamsted Experiment Station, England, in the late seventies, consist of blocks of soil one one-hundredth of an acre in surface and 20, 40, and 60 inches in depth, respectively, isolated by means of trenches and tunnels, sup-

ported by perforated iron plates, and supported from the surrounding soil by stone walls. Facilities for catching the drainage water are provided under each lysimeter.

Lyon's Lysimeters Different

At Cornell, the lysimeters devised by Dr. Lyon are of somewhat different form, being tanks of cement sunk in the ground and each about four and one-half feet square and four feet deep. A sloping bottom is provided, with a drainage channel opening into a tunnel beneath and at one side. As the tanks are arranged in two parallel rows, one tunnel suffices for both. The sides of the tanks are covered with asphaltum to prevent solution. As the soil must be placed in the tanks, some disturbance of its structural condition occurs, but that in time is obviated, so that data obtained regarding the rate of flow and the composition of the drainage water become reliable. Experiments made with the lysimeters must, however, be of long duration. They have given Dr. Lyon results of inestimable value to soil scientists and to farmers.

In 1907, Dr. Lyon made another innovation by the laying out of small field plats on which to repeat each soil treatment four times. The plats being each only one-hundredth of an acre in area, the accuracy of experiments conducted on them depends on repetition of the tests, rather than on area of the plats, as was previously the vogue. Work on these small plats did not entirely satisfy Dr. Lyon, however, and he devised a further improvement in the technique of field experimentation in the form of "frames," which also have come into use at several other experiment stations. The need for their employment was indicated by studies he had made in previous years, relative to errors occurring in other methods of field plat experimentation. His new "frames" have proved especially useful in soil fertility experiments, and some 200 of them are now in use at Cornell.

How Frames Are Made

In making the artificial plats or frames, the soil is removed to plow depth and saved; then walls 6 inches in thickness and sunk 10 inches in the soil are built to a height of 20 inches, which allows for a rim of 2 inches above the soil when the frame is filled with 8 inches of surface soil. Two inches below the top of the wall is at least one opening about an inch in diameter for drainage of water that otherwise might stand on the surface. Tile drains also are laid outside and slightly below one wall of each frame. The foundation for the frames is graded, so that when filled, the soil in each frame will be exactly level. The frames now in use are 4 feet 8 inches by 9 feet 4 inches. They are filled with soil that has been carefully mixed

An interior view of the lysimeters at Cornell University.

and weighed, so that there will be an equal quantity of surface soil in each frame. A full description of the frames is given on pages 596-602 of Vol. 18, No. 7, of the Journal of the American Society of Agronomy for 1926.

Fame in Other Lines

While field experimentation has engaged much of Dr. Lyon's attention, his efforts in other lines has been even more important. He has gained fame by his research work on nitrogen transformations in the soil; the effects of plant growth on the accumulation of nitrates; the syntheses of nitrate nitrogen, leading to the disappearance of nitrates through the activity of the synthesizing organisms; nitrogen fixation; and nitrogen level of soil, as influenced by these various transformations.

The cause of injury to orchards, through the maintenance of sod, was shown by him and his co-workers to be due to the influence of grass in removing the nitrates, thus bringing about a lack of available nitrogen for tree growth. His bulletins, published by the Cornell University Agricultural Experiment Station, present data on many other phases of soil research; and they also are summarized in his wonderfully complete and well-arranged text-books, including "Principles of Soil Management" (with Fippin); "Soils, Their Properties and Management" (with Fippin and Buckman); and "Soil and Fertilizers" (with Buckman).

Dr. Lyon is associate editor of The Journal of The American Society of Agronomy, a Fellow of the American Society of Agronomy, and in 1912 received the Howard N. Potts gold medal and the diploma of the Franklin Institute. In 1913 he studied in the bacteriological laboratory of Professor Löhnis in Leipzig, Germany. He is a clear and concise writer. In his books for students, subjects are paragraphed in a striking and conclusive manner, of which the following is an example:

"The effects of potash are more localized than those of nitrogen and phosphorus. Potash is essential to starch formation, either in photosynthesis or in translocation, and is a necessary component of chlorophyll. It is important in grain formation, giving plump, heavy kernels. In general it tends to impart tone and vigor to a plant. In increasing resistance to disease, it tends to counteract the ill-effects of too much nitrogen, while in delaying maturity, it works against the ripening influences of phosphoric acid. In a general way, it exerts a balancing effect on both nitrogen and phosphate in fertilizing materials, and consequently is necessary in a mixed fertilizer."

Here is another of his arresting statements: "Just exactly what was the cause of the ice age is still under dispute. The most probable theory, both as to its occurrence and as to its disappearance, is that a change in the carbon dioxide content of the atmosphere took place. It is believed that doubling the amount now present would bring about tropical climate in the temperate zones, while halving it would cause frigid conditions and a probable return of the great ice fields."

Best Wishes

We should like to offer further quotations, but it must suffice to advise our student friends to "read, mark, learn, and inwardly digest" the writings of this great scientist and teacher, as eminently sound and authentic.

We sincerely hope that he may be spared to throw more light on the subjects he has found entrancing, and to dwell happily for many years yet in his charming home on "The Circle," overshadowed by the historic buildings of the New York State College of Agriculture.

So, here's long life, love, and luck to "Lysimeter" Lyttleton Lyon, of Cornell!

Fertilize Alfalfa—Then Pasture It

(*From page* 13)

However, a uniform seeding of Grimm alfalfa was secured in Spartan barley after the soil had been limed with seven yards of marl per acre and fertilized with 300 pounds of 2-12-6 fertilizer.

In 1930, the alfalfa was cut for hay, yielding less than a ton per acre. Obviously, something was wrong. The advice of George Grantham of the Soils Department was sought. Grantham long has been investigating the plant-food needs of the various crops commonly grown on the sandy soils of Michigan.

"Need More Potash"

"You need more potash for alfalfa on that type of soil," said Grantham, and following his advice, 300 pounds of 0-10-10 fertilizer were applied as a top-dressing immediately after removal of the hay. In the spring of 1932, Dr. C. E. Millar advised that the paddocks be top-dressed early in April with 300 pounds per acre of 0-14-14 fertilizer.

That these fertilizer applications were effective was evidenced by the fact that on May 17, with a better growth of alfalfa than was available the preceding season, the Guernseys were turned into paddocks to begin the 1932 grazing.

Did pasturing the alfalfa actually pay? With milk testing 4.6 per cent butterfat worth $1.25 per hundred, these cows did all the harvest work and paid approximately $20 per ton for alfalfa. As a cash crop, it was worth $12 per ton at the farm. Incidentally, the manure was left in the field.

What happened to the stand? In these experiments, the pastured alfalfa went into its fourth winter in excellent condition. One southern Michigan farmer expressed himself, "Maybe I did kill out my alfalfa by pasturing it with cattle and sheep, but I never had six years of better grazing."

Lawn-mower clippings to simulate grazing have been injurious to alfalfa, but cows, or even sheep, do not work like a lawn-mower which at one swing defoliates the plants. Judicious grazing is more comparable in final results to the harvesting of alfalfa for hay.

Even though it take a greater toll of plants than hay harvest, the grazing of alfalfa may prove profitable. There really is no good reason for keeping most fields in this section in alfalfa continuously. Four to six years ought to be long enough except on steep or very stony areas.

Will Alfalfa Carry Sheep?

Interested sheepmen have come to us with this: "Your records for grazing alfalfa with dairy cattle will hold water all right, but we want to know what will happen if we pasture alfalfa with sheep. That's what will tell the story." For years, sheep have been known as the class of farm animal under whose grazing it is most difficult for pasture to stand up. Fortunately for the many mutton and wool producers of the Midwest situated on farms where alfalfa can be grown, we have records on this very subject, worked out on the same Kellogg Farm, but on a little different soil type.

On the 14 acres where the sheep pasture tests were carried out, the soil is a Bellefontaine sandy loam. It generally has a two-inch surface layer of dark, grayish-brown sandy loam or fine sandy loam and leaf mold which is underlain by about four inches of grayish-brown sandy loam containing some small gravel. Below this comes

a layer of yellow sandy loam, then a layer of reddish-brown, coherent sandy clay which is sticky when wet. From here down, it is loose sand, gravel, or boulders with occasional spots of limestone and clay. The first four layers of soil are distinctly acid. The soil generally is droughty and of low productivity.

On this soil the problem was what plant combination would provide the best and most continuous pasture for sheep and more particularly, which one would show the most pounds of gain at the scales.

Good Pasture for Sheep

With alfalfa pasture for sheep as with alfalfa pasture for dairy cows we learned the same principle, namely, that this legume growing on a sandy, droughty, infertile soil must have plenty of lime and fertilizer, preferably at least as much potash as phosphorus, and after this has been supplied, alfalfa is outstanding as a pasture for livestock.

Outside of the check plots, the basic treatment was seven yards of marl with 300 pounds per acre of 2-12-6 in 1929. This same dose and analysis were repeated in 1930. In 1931, only nitrogen carriers were applied on three of the grass paddocks.

But in 1932, the basic treatment was changed to 300 pounds per acre of 0-14-14, as much potash as phosphorus. It should be stated in this connection that the most outstanding pasture results were secured during the season of 1932, following this treatment.

In the 1931 trials, alfalfa had 96 sheep-days grazing advantage over sweet clover, gained mostly in June, and went on to add still further to its advantage in August and September when sweet clover furnished nothing. The alfalfa and sweet clover were the same age and had been treated in the same way.

In this same experiment, alfalfa was compared with grass pastures with and without fertilizer treatment. The results were measured by grazing one-acre duplicated paddocks of each treatment with Western lambs. Alfalfa was markedly superior to the grass pastures, fertilized or otherwise, especially in net returns after deducting the fertilizer charges for the season and the cost of grain fed. The lambs paid practically market price for the alfalfa hay and harvested it themselves.

The outstanding fact gained from the 1932 trials is that alfalfa pasture as grazed by these sheep is the only one to return a worthy margin above feed and fertilizer costs. Fertilizing grass pastures under the conditions of this experiment did not pay out. The net returns from the alfalfa used as sheep pasture were well worth while and undoubtedly better than they would have been from alfalfa cut for hay and used as a cash crop at 1932 hay prices.

Bloat Can Be Prevented

Many farmers fear to pasture alfalfa on account of bloat. Both investigators and practical farmers have learned that losses from bloat may be practically eliminated by three simple practices: 1—Keep water and salt readily available at all times; 2—Give the animals a good fill on dry feed just before first turning them in on alfalfa; and 3—Keep the animals on the alfalfa continuously so they will not get excessively hungry or thirsty and overfeed.

In previous statements in this article pointing out specific returns from alfalfa pasture, there is no intention to compare it with alfalfa hay to the disadvantage of the latter. We need alfalfa hay on our farms in Michigan and although there are 750,000 acres growing in the State at the present time, there are still many Michigan farmers who could profitably grow alfalfa. And for those who have sufficient alfalfa for their hay requirements, there is still the opportunity of utilizing an additional acreage to good advantage as pasture.

Faith Anew

(*From page 6*)

a little coaxing with fertilizers and other skillful measures, the weather could be out-foxed nine times out of ten. And in the tenth time, the bins were full anyway.

And every man went out and looked over the meadows, pinching at the plant crowns, pulling at the corn silks, stroking the calves, and patting the deep fleece of the flocks. His thoughts were forward and his glance was skyward. To these men whose fathers before them fled from the terror of inaction and slavery, the ownership and suzerainty of wide acres in a Land of Freedom intoxicated them into a zest for limitless production.

While they agreed with and applauded the critic of extension systems for enhancing the bounties flowing from the horn of Ceres and Pomona, they secretly delved amain into the books and bulletins, rejoiced in 4-H endeavor, and enlisted in the finest army of food-makers that any age has ever accepted with indifference.

SO now their courage is to be tested in quite a different way, having come to the cross-roads beyond which bounty meets charity. There has to be an uprooting of old basic traditions for this year of trial, and the spirit of individual enterprise that founded farming must temporarily subject itself to cooperative control that *is* control.

If victory can be gained in that way without causing anybody to suffer unjustly more than he has already suffered, the outcome may mean the glory of a new morning in the sweet meadows and content once more for the countryman. At any rate it is not tyranny, but the application of self-discipline to correct the old "competitive cooperation."

William Allen White has said that the brood sows will throw obstacles in the path of the farm relief law, willy-nilly, because it stifles the maternal instincts and hogs do not understand clearly the pressing requirements of the hour. Possibly there are others besides the hog who also fail to sense the present responsibility resting upon farm counselors.

Yet in my State where men of varied ancestry till the soil, I find much faith in the future and a reawakened verve not wholly related to the verdant season. Our congress of nations at the plow over here is bound to demonstrate to the Old World that willing compliance with adjustments in times of stress can be attained in a democracy, and that their ancestors did not sail the seas and break the sod simply for a chance to mar freedom with selfishness.

Blood relations of our farmers living across the ocean likewise have felt the pinch, and they too must exert self-regulation for the sake of nature and themselves. A recent journal received from New South Wales might bring brother-in-misery comfort to some of my British contemporaries here. It is called "It's Nice to be a Farmer," and concludes:

It's nice to be a farmer, the life's just
full of fun;
It's sweet to sell your oaten hay at
15 bob a ton;
When eggs are four pence ha'penny
and wheat is one and nine,
Merino wool is seven pence—your bit
of life is fine.

It's nice to be a farmer and work from
dawn to dark,
A hut of slabs and wattle dabs and
an elegant roof of bark;
It's nice to have your fruit trees
and send your fruit to town,
And then be told your fruit is sold and
you owe them half a crown.

BEIN' TOOKED

"Does yo' take this woman for thy lawfully wedded wife?" asked the colored parson, glancing at the diminutive, watery-eyed, bowlegged bridegroom, who stood beside two hundred and ten pounds of feminine assurance.

"Ah takes nothin'," gloomily responded the bridegroom. "Ah's bein' tooked."

Brown: "Did you hear about Mr. Goofus, the bridge expert, being the father of twins?"

Lester Butler: "Yes, looks like his wife doubled his bid."

"Now, children," said the teacher who was trying to boost the sale of the class photographs, "just think how you'll enjoy looking at the photographs when you grow up. As you look you'll say to yourself, 'There's Jennie, she's a nurse; there's Tom, he's a judge;' and—"

"And there's teacher, she's dead," came a voice from the back of the class.

The reason we never hear of women after-dinner speakers is that they can't wait that long.

A Scotsman, upon entering a saddler's, asked for a single spur.

"What use is one spur?" asked the man.

"Well," replied Sandy, "if I can get one side of the horse to go, the other will hae to come wi' it."

SPEEDY

Drunk (entering street car): "Shay, will you put me off thish thing when we get where I'm supposed to get off?"

Street Car Conductor: "Yes, sir, you get off right here!"

Drunk: "Gosh, here already. How time dush fly!"

Charles Lamb had no patience with prudery. Some small boys were enjoying a swim when he passed with a very prim lady. "Isn't it shocking, Mr. Lamb," she said, "to see those little boys in bathing without any clothes?"

Lamb peered in their direction. "R-really, M-madam," he stammered, "until you c-called my attention to it, I wasn't sure whether they were little b-boys or little g-girls."

HAIR-RAISING TALE

Then there was the man who went for raising rabbits and did not take into account their affectionate nature and was soon bothered by superfluous hares.

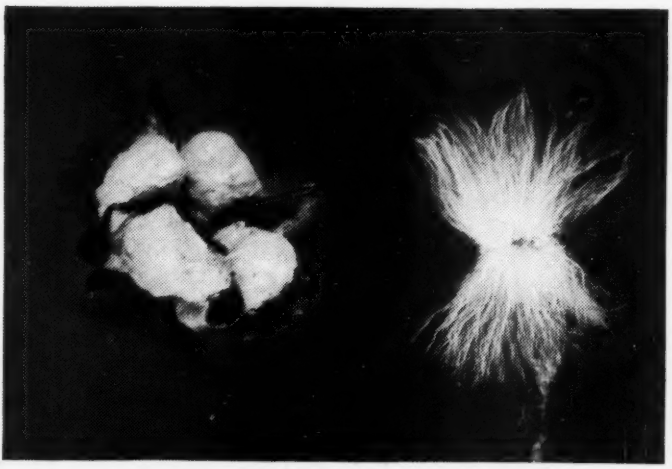
A divinity student named Tweedle,
Once wouldn't accept his degree,
'Cause it's tough enough being called Tweedle,
Without being Tweedle D. D.

Jacob: "Why did Ikey invite only married people to his wedding?"

Abie: "Well, in that way he figured that all the presents would be clear profit."

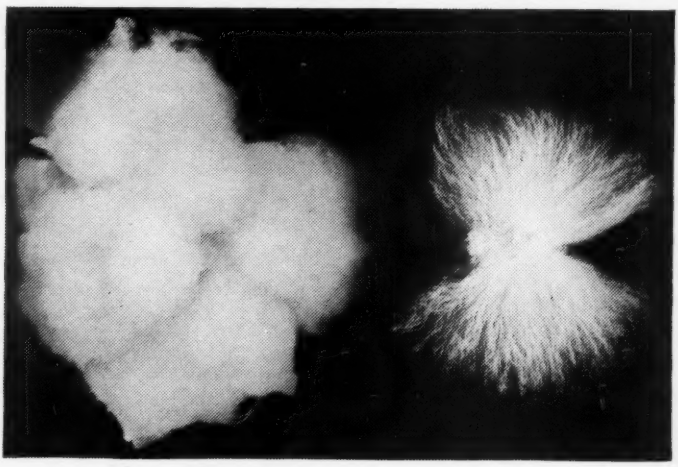
PREVENT RUST
Top-dress with Kainit

RUST did this



Both of these bolls and lint samples were taken from the same field. The whole field received complete fertilizer containing 3% potash. Part of it also was given an extra heavy application of potash. The cotton without the extra potash rusted badly and yielded only 770 pounds of seed cotton per acre. Its lint, measured seven-eighths and was not uniform, with some long and some short fibers. The cotton with the extra potash did not rust and yielded 1,640 pounds of seed cotton per acre. Its lint measured a full inch and was uniform high quality.

POTASH did this



POTASH PREVENTS RUST! When you chop out top-dress with 200 pounds of NV High-grade (20%) Kainit per acre. If you prefer—use 100 pounds of NV Muriate of Potash per acre. *(More potash may be needed if Rust was very severe last season.)* POTASH PAYS!

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